

**LISTING OF CLAIMS:**

Claim 1 (Previously Presented): Apparatus for remotely measuring characteristics of a communications line comprising:

- receiver means for connection to a remote end of the communications line;
- sender means for connection to the other end of the communications line;
- the receiver means generating a signal in response to a selection of one of a plurality of characteristics of the communications line to be measured and connecting predetermined circuitry across the communications line at the remote end based on the selected characteristic;
- the signal uniquely representing the selected characteristic;
- the signal being transmitted along the communications line toward the sender means;
- the sender means having detection means for detecting the signal, and switching means,
- such that on detection of the signal and, on the basis of the unique representation of the signal, the switching means is controlled so as to connect predetermined circuitry across the communications line at the other end to enable the selected characteristic of the communications line to be measured.

WOODING

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

Claim 2 (Previously Presented): Apparatus as claimed in claim 1 wherein the signal is generated by signal generation means and is assigned a unique code such that the unique code is representative of the characteristic of the communications line to be measured.

Claim 3 (Previously Presented): Apparatus as claimed in claim 2 wherein the signal assigned a unique code is represented by a sequence of pulses.

Claim 4 (Previously Presented): Apparatus as claimed in claim 1 wherein on detection by the detection means of the signal, the signal is converted into a digital code.

Claim 5 (Previously Presented): Apparatus as claimed in claim 4, further comprising processor means for receiving and processing the digital code representing the signal.

Claim 6 (Previously Presented): Apparatus as claimed in claim 5 wherein the switching means is controlled by the processor means to connect the predetermined circuitry across the communications line at the other end on the basis of the particular code received and processed by the processor means.

*WOODING*

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

Claim 7 (Previously Presented): Apparatus as claimed in claim 1 including selection means for selecting the characteristic to be measured at random wherein upon selection of the characteristic the predetermined circuitry for enabling the measurement of the selected characteristic is directly connected to the communications line at the other end by the switching means.

Claim 8 (Previously Presented): Apparatus as claimed in claim 7 wherein the random selection of one of a plurality of characteristics is made by depressing one or more respective buttons on the receiver means.

Claim 9 (Previously Presented): Apparatus as claimed in claim 1 wherein the signal is a low frequency signal.

Claim 10 (Previously Presented): A method of remotely measuring characteristics of a communications line, comprising:

- connecting receiver means to a remote end of the communications line;
- connecting sender means to the other end of the communications line;
- causing the receiver means to generate a signal in response to a selection of one of a plurality of characteristics of the communications line to be measured, the signal uniquely representing the selected characteristic;
- connecting predetermined circuitry across the communications line at the remote end based on the selected characteristic;

transmitting the signal along the communications line toward the sender means; and

detecting the signal through the sender means and, on the basis of the unique representation of the signal, controlling switching means to connect predetermined circuitry across the communications line at the other end to enable the selected characteristic of the communications line to be measured.

Claim 11 (Previously Presented): A method as defined in claim 10, further comprising assigning a unique code to the signal after being generated at the receiver means such that the unique code is representative of the characteristic of the communications line to be measured.

Claim 12 (Previously Presented): A method as claimed in claim 11, further including representing the unique code as a sequence of pulses.

Claim 13 (Previously Presented): A method as claimed in claim 10 wherein the detecting is conducted by detection means forming part of the sender means.

Claim 14 (Previously Presented): A method as claimed in claim 13 wherein following the detecting, the signal is converted into a digital code.

Claim 15 (Previously Presented): A method as claimed in claim 14 wherein the controlling is conducted by processor means, the processor means receiving and processing the digital code representing the signal.

Claim 16 (Previously Presented): A method as claimed in claim 15 wherein the switching means is controlled by the processor means to connect the predetermined circuitry across the communications line at the other end on the basis of the digital code received and processed by the processor means.

Claim 17 (Previously Presented): A method as claimed in claim 10 further comprising depressing one or more respective buttons on the receiver means to enable random selection of one of a plurality of characteristics.

Claim 18 (Previously Presented): A method as claimed in claim 10 wherein the selection is performed randomly such that the predetermined circuitry for enabling the measurement of the selected characteristic is directly connected across the communications line at the other end by the switching means.

Claim 19 (Previously Presented): A method of testing a communications line so as to ascertain and measure one or more characteristics of the

communications line employing random switching between functions to select the characteristics, the method comprising:

connecting receiver means to a remote end of the communications line;

connecting sender means to the other end of the communications line;

generating a signal in response to the random selection on the receiver means of one of the one or more characteristics, the signal uniquely representing the selected characteristic;

connecting predetermined circuitry across the communications line at the remote end based on the selected characteristic;

transmitting the signal to the sender means along the communications line;

detecting the signal at the sender means; and

connecting predetermined circuitry, on the basis of the unique representation, across the communications line at the other end to enable the selected characteristic to be ascertained and measured.

Claim 20 (Previously Presented): A method as claimed in claim 19 wherein the connecting is performed by controlling switching means in response to processing of the signal.

*WOODING*

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

Claim 21 (Previously Presented): A method as claimed in claim 19 further comprising depressing one or more buttons on the receiver means corresponding to the selected characteristic.

Claim 22 (Previously Presented): A method as claimed in claim 19 further comprising assigning a code to the signal to uniquely represent the selected characteristic.

Claim 23 (Previously Presented): A method as claimed in claim 22 wherein the code is represented as a sequence of timed pulses generated at the receiver means.

Claim 24 (Previously Presented): Apparatus for testing a communications line so as to ascertain and measure a plurality of characteristics of the line, the apparatus comprising:

receiver means for connection to a remote end of the communications line;

sender means for connection to the other end of the communications line;

selection means enabling the random selection of one of the characteristics;

**WOODING**

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

the receiver means generating a signal in response to the random selection of one of the characteristics and connecting predetermined circuitry across the communications line at the remote end based on the selection;

the signal uniquely representing the selected characteristic and being transmitted along the communications line for receipt by the sender means;

detection means for detecting the transmitted signal;

switching means for connecting predetermined circuitry across the communications line at the other end; and

such that on detection by the detection means of the transmitted signal, the switching means connects the predetermined circuitry to enable the selected characteristic to be ascertained and measured.

Claim 25 (Previously Presented): Apparatus as claimed in claim 24 wherein the signal is generated by signal generating means and is assigned a code.

Claim 26 (Previously Presented): Apparatus as claimed in claim 25 wherein the code is transmitted as a sequence of timed pulses from the signal generating means to the detection means.

Claim 27 (Previously Presented): Apparatus as claimed in claim 25 further comprising processing means for receiving and processing the code and



controlling the switching means to connect the predetermined circuitry across the communications line at the other end on the basis of the code.

Claim 28 (Previously Presented): Apparatus as claimed in claim 24 wherein the selection means comprises a plurality of function buttons corresponding to the plurality of characteristics, whereby a characteristic to be measured is selected by depressing one or more respective function buttons on the receiver means corresponding to the characteristic.

Claim 29 (Previously Presented): Apparatus for remotely measuring characteristics of a communications line, comprising:

a receiver unit connected to one end of the communications line, the receiver unit including a signal generator for generating a signal uniquely representing a characteristic of the communications line to be measured, a signal transmitter for transmitting the generated signal, and predetermined circuitry that is selectively connected across the communications line at the remote end based on the characteristic to be measured; and

a sender unit connected to another end of the communication line, the sender unit including a signal detector that detects the signal transmitted from the receiver unit, measurement-related circuits, and a switching circuit controlled in accordance with the detected signal to selectively connect at least one of the

*WOODING*

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

measurement circuits across the communications line to enable the characteristic of the communications line to be measured.

Claim 30 (Previously Presented): Apparatus as claimed in claim 29, wherein the signal uniquely representing a characteristic of the communications line comprises a coded series of pulses.

Claim 31 (Previously Presented): Apparatus as claimed in claim 29, wherein the switching circuit comprises relays.

Claim 32 (Previously Presented): Apparatus as claimed in claim 29, wherein the characteristic of the communications line is one of the group consisting of signal loss, noise, insulation resistance, loop resistance, and DC voltage.

Claim 33 (Previously Presented): Apparatus as claimed in claim 29, wherein predetermined circuitry of the receiver unit comprises:  
measurement-related circuits; and the receiver unit further comprises:  
a switching circuit for connecting at least one of the measurement-related circuits across the communication line.

*WOODING*

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

Claim 34 (Previously Presented): Apparatus as claimed in claim 1, wherein the communications line is a single line pair and the predetermined circuitry at the other end is connected between the two lines of the single line pair.

Claim 35 (Previously Presented): The method as claimed in claim 10, wherein the communications line is a single line pair and the predetermined circuitry at the other end is connected between the two lines of the single line pair.

Claim 36 (Previously Presented): The method as claimed in claim 19, wherein the communications line is a single line pair and the predetermined circuitry at the other end is connected between the two lines of the single line pair.

Claim 37 (Previously Presented): Apparatus as claimed in claim 24, wherein the communications line is a single line pair and the predetermined circuitry at the other end is connected between the two lines of the single line pair.

*WOODING*

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

Claim 38 (Previously Presented): Apparatus as claimed in claim 29, wherein the communications line is a single line pair and the measurement-related circuits are connected between the two lines of the single line pair.

Claim 39 (Previously Presented): Apparatus as claimed in claim 29, wherein the characteristic of the line has a meter-based numeric value and the measurement-related circuits connected across the line at the another end enable the numeric value of the characteristic to be measured from the one end.

Claim 40 (Previously Presented): Apparatus as claimed in claim 29, wherein the sender unit is connected between the receiver unit and an exchange switch and the measurement-related circuits include an incoming call-preventing circuit that prevents calls supplied to the sender unit from the exchange switch from being connected to the communications line.

Claim 41 (Previously Presented): Apparatus as claimed in claim 40, wherein the incoming call-preventing circuit comprises a resistor.

Claim 42 (Previously Presented): Apparatus as claimed in claim 29, wherein the measurement-related circuits connected across the communications line comprise an oscillator.

Claim 43 (Previously Presented): Apparatus as claimed in claim 29, wherein the receiver unit includes a push-button panel operable by a user for randomly selecting the characteristic of the communications line to be measured, and a display for displaying a numeric value of the selected characteristic.

Claim 44 (Previously Presented): Apparatus for measuring characteristics of a communications line, comprising:

a receiver unit connected to one end of the communications line, the receiver unit comprising a signal generator that generates signals each of which uniquely corresponds to a different characteristic of the communications line, an input device supplied with an input for selecting one of the characteristics and causing output of the signal corresponding to the selected characteristic to the communications line, first predetermined circuitry comprising circuitry portions each for use in measuring one or more of the different characteristics, and first switching circuitry for connecting across the one end of the communications the circuitry portion of the first predetermined circuitry for measuring the selected characteristic; and

a sender unit connected to another end of the communications line, the sender unit comprising a signal detector that detects the signal corresponding to the selected characteristic, second predetermined circuitry comprising circuitry portions each for use in measuring one or more of the different characteristics and, second switching circuitry for connecting across the other end of the

*WOODING*

Serial No.: 09/444,723

Response to Office Action dated June 22, 2004

communications line the circuitry portion of the second predetermined circuitry for measuring the selected characteristic.